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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/792,018
Filing Date: March 02, 2004
Appellant(s): LAMPINEN ET AL.

Kenneth Q. Lao
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/17/2007 appealing from the Office action mailed 7/20/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

7,158,558	PETRE ET AL	1-2007
2002/0196842	ONGGOSANUSI ET AL	12-2002

(9) Grounds of Rejection

The following ground of rejection are applicable to the appealed claims:

Claims 3-7, 9-12, 14-18 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petre et al (US 7,158,558) in view of Onggosanusi et al (US 2002/0196842).

Regarding claims 3, 6, 7, 9, 11, 12, 14, 17, 18, 20 and 22-25, Petre discloses a method of communication using a common pilot channel (CPICH) in a W-CDMA receiver (column 1, lines 19-34). The receiver receives the CPICH (column 13, line 34 to column 14 line 2). The signal is equalized using chip level equalization and the equalized CPICH channel is despread (column 6, line 62 to column 7, line 12 and figure 3). Petre does not disclose estimating the signal to interference ratio (SINR) from the despread CPICH. Onggosanusi discloses the W-CDMA receiver shown in figure 3. The CPICH channel is despread in the receiver (paragraph 0056). The SINR is determined from the despread CPICH channel in the basis selector 84 (paragraph 0069). This value is input to the joint interference cancellation and detector unit 88 in figure 3. The removal of the channel effect is advantageous since it allows the originally transmitted data to be properly recognized and recovered (paragraph 0006). For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the estimation and interference detection and cancellation method of Onggosanusi in to the method of Petre. The combination discloses the transmitter comprises multiple antennas (Onggosanusi, figure 3 and paragraph 0049). It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the antenna diversity of Onggosanusi into the method of Petre. Multiple antennas for transmission allow multiple paths to be received at the receiver and fading

and other interference can be overcome, which allows the signal to be received with fewer errors.

Regarding claims 4 and 16, the combination discloses the method comprises combining the channel and chip level filtering at the equalizer. A combination of the channel and the receiver's chip level filtering at the equalizer can be seen as a virtual channel.

Regarding claims 5, 10 and 15, the combination discloses oversampling the received signal (Petre, column 15, lines 10-43).

Regarding claim 21, the receiver is in a mobile terminal.

(10) Response to Argument

(A) Introduction

Prior to responding to arguments, the examiner would like to describe the field of invention, which is the same for the application and for the Petre et al and Onggosanusi et al references.

In communication systems, a transmitter transmits a signal to a receiver over a transmission medium. Transmission media will introduce noise or some other type of distortion into the received signal, which causes errors to occur in the decoding process after the transmitted signal has been received at the receiver. In spread spectrum systems, many user signals are transmitted at the same time. The

base station and users communicating with the base station each employ assigned pseudo-random sequences, also known as pseudo-noise (PN) code sequences, for spreading of the channels so that all user signals can occupy the radio frequency bandwidth and noise in the channel will have a lessened effect on the transmitted data. The received signal will be despread at the receiver. Additional methods are used to combat distortion in the channel. One of these methods is transmitter diversity. Transmitter diversity utilizes a plurality of antenna to transmit data over a plurality of paths. This will allow the transmission to improve the signal-to-noise ratio of the received signal.

(B) Description of the Petre et al reference

Petre discloses a method of using a wideband direct sequence multiple access (WCDMA) telecommunications system (column 1, lines 19-34). A Common Pilot Channel (CPICH) is transmitted in the WCDMA system to transfer control information from the transmitter to the receiver. This signal will be spread at the transmitter and despread at the receiver. Since interference from the channel is present on the transmitted signal at the receiver, additional processing of the signal takes place. Chip level equalization is conducted (column 7, lines 1-12) to suppress multi-user interference before despreading and descrambling (column 6, lines 62-67).

(C) Description of the Onggosanusi et al reference

Onggosanusi discloses a method of using the WCDMA system shown in figure 3 and figure 4. Figure 3 discloses the receiver 74 includes a channel estimator 82 that receives pilot symbols from the receive antennas where the pilot symbols are typically communicated in a separate channel such as the known common pilot channel (CPICH). The pilot symbols are spread by transmitter 72 with a code that differed from the code used to spread the data channel (paragraph 0056). A signal-to interference/noise-ratio (SNIR) is determined from the despread CPICH in the basis selector 84. By using the determined SINR and the channel estimate, interference present in the received signal can be removed. This is carried out in the joint interference cancellation and detector portion of the receiver (paragraph 0069). Onggosanusi discloses the transmitter diversity aspect of the receiver in paragraph 0007. The transmit diversity allows for higher data rate transmissions (paragraph 0007). The use of multiple antennas will improve the SNR of the signal, increasing the quality of the received signal. The use of this transmitter diversity generates space time diversity transmissions and these transmissions are received in receiver 74. Onggosanusi further discloses the embodiment in figure 4 where additional encoding of the transmission is conducted. Space time block coded transmit antenna diversity (STTD) encoders 105 further process the data to be transmitted and STTD decoders 110 will decode the encoded data in the receiver. The pilot symbol signals are output from despreader 32” to a channel estimator 82’ as was the case in the system 70 shown

in figure 3 (paragraph 0088). The pilot symbols are transmitted in a separate channel as described in the embodiment shown in figure 3 (paragraph 0088).

(D) Response to argument

The examiner discusses the claims in the same order as the appellant.

Claim 3- Appellant states the examiner is silent on whether Onggosanusi discloses the signal stream is the form for space-time transmit diversity transmission. The examiner disagrees.

Onggosanusi discloses the transmitter diversity aspect of the receiver of figure 3 in paragraph 0007. The transmit diversity allows for higher data rate transmissions and the use of multiple antennas will improve the SNR of the signal, increasing the quality of the received signal. The use of this transmitter diversity generates space time diversity transmissions and these transmissions are received in receiver 74. Onggosanusi further discloses the embodiment in figure 4 where additional encoding of the transmission is conducted. Space time block coded transmit antenna diversity (STTD) encoders 105 further process the data to be transmitted and STTD decoders 110 will decode the encoded data in the receiver.

Appellant acknowledges Onggosanusi uses a MIMO system with double space-time block coded transmit antenna diversity (DSTTD) on page 7 of the appeal brief (last

full paragraph) but states the STTD system is different from a signal stream in the space-time transmit diversity transmission as claimed. However, the double space-time block coded transmit antenna diversity transmission is inherently a space-time transmit diversity transmission since double <u>space-time</u> block coded <u>transmit</u> antenna <u>diversity transmission</u> is a specific type of space-time transmit diversity transmission. The claim does not recite the specific type of space-time transmit diversity transmission that is used in the method. Therefore, all types of space-time transmit diversity transmissions are acceptable for the method of claim 3. Onggosanusi disclosed a specific type of space-time transmit diversity transmission, DSTTD, is used in figure 4. Claim 3 does not exclude this specific type as appellant's remarks appear to suggest. Since no particular type of space-time transmit diversity transmission is specifically recited in the claim nor the specific type of space-time transmit diversity transmission disclosed by the combination of references (the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 disclosed in Onggosanusi) is specifically excluded, appellant argues features that are not recited in the claim. In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (i.e., the exclusion of the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 recited in Onggosanusi) are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appellant states the spatially parallel transmissions cause additional interference and this interference would not be correctly taken into account by the pilot processing for the DSTTD scheme. Onggosanusi appears to disagree. Figure 4 discloses the embodiment using the DSSTD scheme. Paragraph 0088 discloses the pilot symbol signals are despread and input to a channel estimator. The pilot symbols are spread with a different code than was used for the data symbols. Each of the decoders performs combining and block decoding to generate sufficient statistics for symbol detection. Due to operation of block 88', the effect of inter-stream interference from the signals is suppressed. Throughout paragraphs 0089-0097, Onggosanusi discloses the processing in the receiver is done to optimize the system and the SINR or SNR is maximized.

In addition, Claim 3 recites "wherein the spread spectrum receiver is adapted to receive a signal stream in space-time diversity transmission". MPEP 2111.04 states claim scope is not limited by claim language that does not require a step to be performed or by claim limitations that does not limit a claim to a particular structure. Examples of claim language that may raise a question as to the limiting effect of the language in a claim are (A) "adapted to" clauses. The limitation of claim 3 at issue does not limit the claimed receiver to a particular structure nor does the limitation require a particular step to be performed other than the receiver to receive a spread signal.

For these reasons and the reasons stated in the previous office actions, the rejection of the claim addresses all of the claim's limitations. Therefore, it is requested the rejection of claim 3 be sustained.

Claim 6- Appellant states the examiner is silent on whether Onggosanusi discloses the signal stream is the form for space-time transmit diversity transmission. The examiner disagrees.

Onggosanusi discloses the transmitter diversity aspect of the receiver of figure 3 in paragraph 0007. The transmit diversity allows for higher data rate transmissions and the use of multiple antennas will improve the SNR of the signal, increasing the quality of the received signal. The use of this transmitter diversity generates space time diversity transmissions and these transmissions are received in receiver 74. Onggosanusi further discloses the embodiment in figure 4 where additional encoding of the transmission is conducted. Space time block coded transmit antenna diversity (STTD) encoders 105 further process the data to be transmitted and STTD decoders 110 will decode the encoded data in the receiver.

Appellant acknowledges Onggosanusi uses a MIMO system with double space-time block coded transmit antenna diversity (DSTTD) on page 7 of the appeal brief (last full paragraph) but states the STTD system is different from a signal stream in the space-time transmit diversity transmission as claimed. However, the double space-time block coded transmit antenna diversity transmission is inherently a space-time transmit diversity transmission since double <u>space-time</u> block coded <u>transmit</u> antenna <u>diversity transmission</u> is a specific type of space-time transmit diversity transmission. The claim does not recite the specific type of space-time transmit diversity transmission that is used in the receiver. Therefore, all types of space-time transmit diversity transmissions are acceptable in the receiver of claim 6. Onggosanusi disclosed a specific type of

space-time transmit diversity transmission, DSTTD, is used in figure 4. Claim 6 does not exclude this specific type as appellant's remarks appear to suggest. Since no particular type of space-time transmit diversity transmission is specifically recited in the claim nor the specific type of space-time transmit diversity transmission disclosed by the combination of references (the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 disclosed in Onggosanusi) is specifically excluded, appellant argues features that are not recited in the claim. In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (i.e., the exclusion of the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 recited in Onggosanusi) are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appellant states the spatially parallel transmissions cause additional interference and this interference would not be correctly taken into account by the pilot processing for the DSTTD scheme. Onggosanusi appears to disagree. Figure 4 discloses the embodiment using the DSSTD scheme. Paragraph 0088 discloses the pilot symbol signals are despread and input to a channel estimator. The pilot symbols are spread with a different code than was used for the data symbols. Each of the decoders performs combining and block decoding to generate sufficient statistics for symbol detection. Due to operation of block 88', the effect of inter-stream interference from the

signals is suppressed. Throughout paragraphs 0089-0097, Onggosanusi discloses the processing in the receiver is done to optimize the system and the SINR or SNR is maximized.

In addition, Claim 6 recites “wherein the received chips are obtained from a signal stream in space-time transmit diversity transmissions”. MPEP 2111.04 states claim scope is not limited by claim limitations that does not limit a claim to a particular structure. Examples of claim language that may raise a question as to the limiting effect of the language in a claim are (B) "wherein" clauses. The limitation of claim 6 at issue does not limit the claimed receiver to a particular structure. The wherein clause is referring to the format of the received signal stream and, therefore, does not limit the receiver to a particular structure.

For these reasons and the reasons stated in the previous office actions, the rejection of the claim addresses all of the claim’s limitations. Therefore, it is requested the rejection of claim 6 be sustained.

Claim 11- Appellant states the examiner is silent on whether Onggosanusi discloses the signal stream is the form for space-time transmit diversity transmission. The examiner disagrees.

Onggosanusi discloses the transmitter diversity aspect of the receiver of figure 3 in paragraph 0007. The transmit diversity allows for higher data rate transmissions and the use of multiple antennas will improve the SNR of the signal, increasing the quality of the received signal. The use of this transmitter diversity generates space time diversity transmissions and these transmissions are received in receiver 74. Onggosanusi further

discloses the embodiment in figure 4 where additional encoding of the transmission is conducted. Space time block coded transmit antenna diversity (STTD) encoders 105 further process the data to be transmitted and STTD decoders 110 will decode the encoded data in the receiver.

Appellant acknowledges Onggosanusi uses a MIMO system with double space-time block coded transmit antenna diversity (DSTTD) on page 7 of the appeal brief (last full paragraph) but states the STTD system is different from a signal stream in the space-time transmit diversity transmission as claimed. However, the double space-time block coded transmit antenna diversity transmission is inherently a space-time transmit diversity transmission since double <u>space-time</u> block coded <u>transmit</u> antenna <u>diversity transmission</u> is a specific type of space-time transmit diversity transmission. The claim does not recite the specific type of space-time transmit diversity transmission that is used in the system. Therefore, all types of space-time transmit diversity transmissions are acceptable in the system of claim 11. Onggosanusi disclosed a specific type of space-time transmit diversity transmission, DSTTD, is used in figure 4. Claim 11 does not exclude this specific type as appellant's remarks appear to suggest. Since no particular type of space-time transmit diversity transmission is specifically recited in the claim nor the specific type of space-time transmit diversity transmission disclosed by the combination of references (the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 disclosed in Onggosanusi) is specifically excluded, appellant argues features that are not recited in the claim. In response to appellant's argument that the references fail to show certain features of appellant's

invention, it is noted that the features upon which appellant relies (i.e., the exclusion of the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 recited in Onggosanusi) are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appellant states the spatially parallel transmissions cause additional interference and this interference would not be correctly taken into account by the pilot processing for the DSTTD scheme. Onggosanusi appears to disagree. Figure 4 discloses the embodiment using the DSSTD scheme. Paragraph 0088 discloses the pilot symbol signals are despread and input to a channel estimator. The pilot symbols are spread with a different code than was used for the data symbols. Each of the decoders performs combining and block decoding to generate sufficient statistics for symbol detection. Due to operation of block 88', the effect of inter-stream interference from the signals is suppressed. Throughout paragraphs 0089-0097, Onggosanusi discloses the processing in the receiver is done to optimize the system and the SINR or SNR is maximized.

For these reasons and the reasons stated in the previous office actions, the rejection of the claim addresses all of the claim's limitations. Therefore, it is requested the rejection of claim 11 be sustained.

Claim 17- Appellant states the examiner is silent on whether Onggosanusi discloses the signal stream is the form for space-time transmit diversity transmission. The examiner disagrees.

Onggosanusi discloses the transmitter diversity aspect of the receiver of figure 3 in paragraph 0007. The transmit diversity allows for higher data rate transmissions and the use of multiple antennas will improve the SNR of the signal, increasing the quality of the received signal. The use of this transmitter diversity generates space time diversity transmissions and these transmissions are received in receiver 74. Onggosanusi further discloses the embodiment in figure 4 where additional encoding of the transmission is conducted. Space time block coded transmit antenna diversity (STTD) encoders 105 further process the data to be transmitted and STTD decoders 110 will decode the encoded data in the receiver.

Appellant acknowledges Onggosanusi uses a MIMO system with double space-time block coded transmit antenna diversity (DSTTD) on page 7 of the appeal brief (last full paragraph) but states the STTD system is different from a signal stream in the space-time transmit diversity transmission as claimed. However, the double space-time block coded transmit antenna diversity transmission is inherently a space-time transmit diversity transmission since double <u>space-time</u> block coded <u>transmit</u> antenna <u>diversity transmission</u> is a specific type of space-time transmit diversity transmission. The claim does not recite the specific type of space-time transmit diversity transmission used in the device. Therefore, all types of space-time transmit diversity transmissions are acceptable in the device of claim 17. Onggosanusi disclosed a specific type of space-

time transmit diversity transmission, DSTTD, is used in figure 4. Claim 17 does not exclude this specific type as appellant's remarks appear to suggest. Since no particular type of space-time transmit diversity transmission is specifically recited in the claim nor the specific type of space-time transmit diversity transmission disclosed by the combination of references (the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 disclosed in Onggosanusi) is specifically excluded, appellant argues features that are not recited in the claim. In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (i.e., the exclusion of the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 recited in Onggosanusi) are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appellant states the spatially parallel transmissions cause additional interference and this interference would not be correctly taken into account by the pilot processing for the DSTTD scheme. Onggosanusi appears to disagree. Figure 4 discloses the embodiment using the DSSTD scheme. Paragraph 0088 discloses the pilot symbol signals are despread and input to a channel estimator. The pilot symbols are spread with a different code than was used for the data symbols. Each of the decoders performs combining and block decoding to generate sufficient statistics for symbol detection. Due to operation of block 88', the effect of inter-stream interference from the

signals is suppressed. Throughout paragraphs 0089-0097, Onggosanusi discloses the processing in the receiver is done to optimize the system and the SINR or SNR is maximized.

For these reasons and the reasons stated in the previous office actions, the rejection of the claim addresses all of the claim's limitations. Therefore, it is requested the rejection of claim 24 be sustained.

Claim 24- Appellant states the examiner is silent on whether Onggosanusi discloses the signal stream is the form for space-time transmit diversity transmission. The examiner disagrees.

Onggosanusi discloses the transmitter diversity aspect of the receiver of figure 3 in paragraph 0007. The transmit diversity allows for higher data rate transmissions and the use of multiple antennas will improve the SNR of the signal, increasing the quality of the received signal. The use of this transmitter diversity generates space time diversity transmissions and these transmissions are received in receiver 74. Onggosanusi further discloses the embodiment in figure 4 where additional encoding of the transmission is conducted. Space time block coded transmit antenna diversity (STTD) encoders 105 further process the data to be transmitted and STTD decoders 110 will decode the encoded data in the receiver.

Appellant acknowledges Onggosanusi uses a MIMO system with double space-time block coded transmit antenna diversity (DSTTD) on page 7 of the appeal brief (last full paragraph) but states the STTD system is different from a signal stream in the space-time transmit diversity transmission as claimed. However, the double space-time

block coded transmit antenna diversity transmission is inherently a space-time transmit diversity transmission since double space-time block coded transmit antenna diversity transmission is a specific type of space-time transmit diversity transmission. The claim does not recite the specific type of space-time transmit diversity transmission used in the system. Therefore, all types of space-time transmit diversity transmissions are acceptable in the system of claim 24. Onggosanusi disclosed a specific type of space-time transmit diversity transmission, DSTTD, is used in figure 4. Claim 24 does not exclude this specific type as appellant's remarks appear to suggest. Since no particular type of space-time transmit diversity transmission is specifically recited in the claim nor the specific type of space-time transmit diversity transmission disclosed by the combination of references (the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 disclosed in Onggosanusi) is specifically excluded, appellant argues features that are not recited in the claim. In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (i.e., the exclusion of the space time transmitter diversity transmissions shown in figure 3 or the DSTTD shown in figure 4 recited in Onggosanusi) are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appellant states the spatially parallel transmissions cause additional interference and this interference would not be correctly taken into account by the pilot processing

for the DSTTD scheme. Onggosanusi appears to disagree. Figure 4 discloses the embodiment using the DSSTD scheme. Paragraph 0088 discloses the pilot symbol signals are despread and input to a channel estimator. The pilot symbols are spread with a different code than was used for the data symbols. Each of the decoders performs combining and block decoding to generate sufficient statistics for symbol detection. Due to operation of block 88', the effect of inter-stream interference from the signals is suppressed. Throughout paragraphs 0089-0097, Onggosanusi discloses the processing in the receiver is done to optimize the system and the SINR or SNR is maximized.

For these reasons and the reasons stated in the previous office actions, the rejection of the claim addresses all of the claim's limitations. Therefore, it is requested the rejection of claim 24 be sustained.

Claims 4 and 16- Appellants rely on the patentability of the parent claims regarding claims 4 and 16. Therefore, the response to the argument for claims 4 and 16 is the same as the response to argument for claims 3 and 11 stated above.

Claims 5, 10 and 15- Appellants rely on the patentability of the parent claims regarding claims 5, 10 and 15. Therefore, the response to the argument for claims 5, 10 and 15 is the same as the response to argument for claims 3, 6 and 11 stated above.

Claim 21- Appellants rely on the patentability of the parent claims regarding claim 21. Therefore, the response to the argument for claim 21 is the same as the response to argument for claim 17 stated above.

Claims 7, 9, 12, 14, 18, 20-23 and 25- Appellants rely on the patentability of the parent claims regarding claims 7, 9, 12, 14, 18, 20-23 and 25. Therefore, the response to the argument for claims 7, 9, 12, 14, 18, 20-23 and 25 is the same as the response to argument for claims 3, 6, 11, 17 and 24 stated above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Kevin M. Burd/

Primary Examiner, Art Unit 2611

Kevin M. Burd

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/Jason Chan/
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